

REMARKS

Claims 1-7 and 9-55 are pending in the present application. Claim 8 has previously been canceled. Claims 21-55 have been added to more particularly define what Applicants regard as their invention.

Claim 1, 15, 18, 24, 26, 35, 46 are independent.

Summary of Examiner Interview

Applicants appreciate the courtesies extended by Examiner Xiao Wu to their representatives including Applicants' attorney, Mr. Cammarata, inventor Mr. Someya and Applicants' in-house patent attorney Ms. Shirakashi. This interview was conducted on October 25, 2004.

During this interview, inventor Mr. Jun Someya first presented an explanation of the inventive concepts and operation as well as the operation of the Wakisawa Patent that is being applied to reject the pending claims. Mr. Cammarata supplemented this explanation with an explanation as to how the key inventive features are being recited in the claims and how those claim features clearly distinguish over Wakisawa. The substance of these arguments are repeated below.

After listening attentively to these explanations and arguments, Examiner Xiao Wu agreed that Wakisawa does not

disclose or suggest determining a localized zoom ratio as was recited in proposed new claim 21.

Because this localized zoom ratio has now been added to each of the pending claims and is also part of the newly added claims, Applicants respectfully submit that all of the claims are now clearly in condition for allowance in keeping with the agreement reached during the interview. Therefore, Applicants respectfully request an early indication of allowability in the form of a Notice of Allowance.

Art Rejection

Claims 1-7 and 9-20 are rejected under 35 U.S.C. § 102(b) as being anticipated by Wakisawa (USP 6,002,810). This rejection, insofar as it pertains to the presently pending claims, is respectfully traversed.

Wakisawa performs resolution conversion based on an instructed conversion magnification factor. Although this overall conversion magnification factor may vary from image to image, this conversion magnification factor is fixed with respect to each image being converted in resolution. In other words, Wakisawa's conversion magnification factor is fixed with respect to each image and does not vary from one value to another within a given image.

In contrast, the claims clearly recite a "localized zoom ratio" which does vary within a given image. In particular, the claimed localized zoom ration is based on high spatial frequency information of local input pixels. This high spatial frequency information is detected from pixel-to-pixel variations in the intensity levels in at least one direction in the input image as further recited in independent claim 1. Thus, local pixel-to-pixel variations in intensity give rise to high spatial frequency information that is detected by the claimed inventive method. This enables the invention to determine a localized zoom ratio that is based on this high spatial frequency information of local input pixels. There is no such concept disclosed or suggested by Wakisawa.

Furthermore, Wakisawa also fails to disclose or suggest setting interpolation points with spacing between the interpolation points varying according to the localized zoom ratio as further recited in independent claim 1.

In contrast, Wakisawa utilizes an overall conversion magnification factor that is fixed with respect to each image. Evidence of this fixed or overall conversion magnification factor can be found in column 4, lines 60-67 as well as in column 11, lines 19-26 in which a single magnification factor is input and utilized to convert the entire image. Thus, Wakisawa's

magnification factor is a fixed value for the entire image and certainly does not disclose or suggest the localized zoom ratio which may vary from location to location in the image based on the high spatial frequency information of local input pixels as recited in amended independent claim 1.

Further in regards to Wakisawa, this patent does utilize two different interpolation functions f_1 and f_2 which are most clearly shown in Fig. 14B. Interpolation function f_1 is a straight-line interpolation function while function f_2 is a curved or spline interpolation function. The choice between interpolation functions f_1 and f_2 , in Wakisawa, is based on a calculated difference value (d). If the difference value (d) is equal to or less than a threshold, then function f_1 (straight line) is utilized to link the gray scale levels of the adjacent pixels while function f_2 is utilized if the threshold is exceeded by the difference value (d). This is discussed in column 8, lines 38-53 with respect to function f_1 while similar statements are made as to interpolation function f_2 in column 8, lines 53-58.

Applicants further submit that the "positioning" language utilized by Wakisawa does not actually determine the position or spacing of the interpolation pixels. Instead, this "positioning" is of the interpolation pixel magnitude or gray scale relative

to the interpolation equation or function. These interpolation functions f1, f2 that are utilized by Wakisawa are merely standard interpolation functions that determine the magnitude or gray scale level value of the interpolated pixel based on original pixel values. Such a choice between interpolation functions certainly does not disclose or suggest the claimed determining localized zoom ratio based on high spatial frequency information of local input pixels or setting interpolation points with spacing between the interpolation points varying according to their localized zoom ratio as further recited in independent claim 1.

Similar distinguishing language may be found in the other pending independent claims. For example, independent claim 15 recites a first processing unit that determines a localized zoom ratio based on the high spatial frequency information of local input pixels and a second processing unit that sets interpolation points with spacing between the interpolation points varying according to the localized zoom ratio. These features are completely absent from Wakisawa as further argued above.

With regard to independent claim 18, this claim has been amended to recited that the first processing unit determines a localized zoom ratio based on the high spatial frequency

information of local input pixels. This first processing unit, particularly taken in combination with the second processing unit that calculates interpolation points with spacing between the interpolation point varying according to the localized zoom ratio provide clear, patentable, and distinguishing bases from Wakisawa.

Still further, newly submitted independent claim 24 also recites the localized zoom ratio concept and the determination of localized inter-pixel spacing values between interpolation points that is based on this determined localized zoom ratio. At least these features distinguish over Wakisawa.

Moreover, newly submitted independent claim 26 also recites determining a localized zoom ratio (based on local pixel variation patterns) which also serves as a distinguishing basis over Wakisawa since no such determination is performed or suggested by Wakisawa. Wakisawa also fails to disclose or suggest the setting of interpolation points with spacing between the interpolation points varying based on the localized zoom ratio as further recited in new independent claim 26.

Even further, newly submitted independent claim 35 recites determining a localized zoom ratio α based on the plurality of local pixel variation patterns and determining a further quantity β based on the magnitude of pixel variation patterns.

These features, particularly taken in combination with setting interpolation points with spacing between the interpolation points varying based on the localized zoom ratio α and the further quantity β , provide clear distinguishing bases over Wakisawa.

With respect to new independent claim 46, there is recited determining the localized zoom ratio α based on the plurality of local pixel variation patterns in determining a further quantity γ based on the magnitude of local pixel variation patterns. These features particularly when taken in combination with setting interpolation points with spacing between the interpolation points varying based on the localized zoom ratio α and the further quantity γ provide clear distinguishing bases over Wakisawa.

Because the Examiner has already agreed that the localized zoom ratio concept and its use in setting interpolation points with spacing between the interpolation points varying based on the localized zoom ratio are patentable features and because these features are now present in all of the independent claims, Applicants respectfully submit that the claims now clearly define allowable subject matter.

For all of the above reasons, taken alone or in combination, Applicants respectfully request reconsideration and withdrawal of the § 102(b) Wakisawa rejection.

Conclusion

In view of the above amendments and remarks, the Examiner is respectfully requested to reconsider the outstanding rejections and issue a Notice of Allowance in the present application.

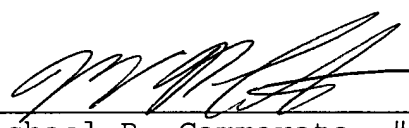
Should the Examiner believe that any outstanding matters remain in the present application, the Examiner is respectfully requested to contact Michael R. Cammarata (Reg. No. 39,491) at the telephone number of the undersigned to discuss the present application in an effort to expedite prosecution.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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